JPRS 76781

7 November 1980

China Report

SCIENCE AND TECHNOLOGY

No. 67

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JPRS 76781

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CHINA REPORT

SCIENCE AND TECHNOLOGY

No. 67

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APPLIED SCIENCES

DEVELOPMENTS, FUTURE OF CHINA'S SPACE ELECTRONICS

Beijing DIANZI XUEBAO [ACTA ELECTRONICA SINICA] in Chinese No 2, Jun 80 pp 78-79

[Article by Chen Fangyun [7115 5364 0336], Pan Huajiang [3382 5478 3068] and Wang Yifei [3076 0001 7378]: "The Development and Future Prospects of Space Electronics"]

[Excerpts] (Abstract) This paper summarizes and reviews the radio electronic technology used in the field of space electronics, including tracking and control of artificial satellites, space exploration, observation of the earth by satellites, satellite communication and broadcasting and fixing the position of moving objects by satellites. More prominent space electronics systems of recent years and their accomplishments are cited, and features unique to space electronics are analyzed. This paper also gives a brief introduction to space electronics developments in China and, in conclusion, to the future prospects of space electronics.

V. Standard and Unique Features of Space Electronics in China

It has been 10 years since China launched its first earth satellite, and it would be 15 years if one counted from the year China began its space research (and hence the work on space electronics). In these 15 years, China has established a foundation for space electronics through great coordinated efforts by the various institutes in the nation and, in the process, thousands of space electronics researchers and technicians have been cultivated and a substantial technical base for experimentation and for manufacturing has been built. The eight satellites launched by China carry a variety of electronic equipment and instrumentation, including remote sensing, remote control, signal transmitter and receiver for orbit monitoring, and various other kinds of instruments for space exploration. We have established a fair amount of ground systems for satellite monitoring and control, with most of them being radio electronic systems. The entire sensing and control system is centrally managed by one computer center, in which different data are processed. We are able to control the return of the satellites to earth and to forecast the landing location relatively accurately, which makes China the third nation in the world, next to only the United States and the Soviet Union, to have the know-how for satellite recovery.

Recalling the history and looking into the future of China's development in space electronics, we can tentatively identify the following unique features:

1. We have insisted on the principles of self-reliance and self-sufficiency. Up until now, all electronic instruments used in our space electronics were developed and built by ourselves; not one piece of material or component in this equipment was not made in China. In development work, from system design and scientific research to manufacturing and testing, all problems were solved through our own efforts and thro[illegible]gh thorough investigation and utilization of foreign data, with our own innovations and improvements in certain cases. As for ground monitoring and control systems, we are also entirely self-sufficient without the benefit of foreign facilities. All these are achievements of which we can be proud. On the other hand, since we have not taken advantage of international cooperation, we have been relatively slow in certain developments and have been falling behind. In the future we should take reasonable advantage of the benefits of international cooperation and selectively introduce advanced technology so that our space electronics will move forward at a faster pace.

2. We have employed the principle of composite usage. Ever since China's first satellite, we have been taking into consideration the multiple usage idea for efficient use of satellite-borne equipment and electric power sources. On our first satellite, the music "East Is Red" and the satellite remote-sensing signals were transmitted down to earth by the same transmitter on a timesharing basis. Both signals can be received by the same communications receiver and theoutput recorded by the same recorder. In developing the ultrashortwave double-frequency Doppler shift orbit monitor system, we once again used the same principle and combined it with the satellite remote-sensing signal without compromising the accuracy of velocity measurements. New satellite tracking systems capable of handling multiple signals for high-precision angular and distance measurements are now in the developmental stage.

3. We must overcome the difficulties in signal transmission and in monitoring and control caused by geographic limitations. From satellite tracking and monitoring points of view, the longitudinal and latitudinal span of China poses certain difficulties. For a satellite in its circular orbit at an altitude of 200 km, observations made of China usually can cover only a small circular arc of 3 to 4 consecutive orbits, and within a given day there would be 7 or 8 consecutive orbits that do not pass over China at all. Similar problems exist for satellites in 1,000-km orbits. As a result, information collected over foreign countries cannot be transmitted back to the Chinese ground-receiving stations in time. This situation is detrimental to the collection of a wide range of weather and oceanographic data. In the meantime, the limited visibility of the satellite orbits also impairs accuracy in orbit determination and makes it difficult to pinpoint the satellite's location when it is not over China. This is particularly true for the several consecutive orbits that do not pass over China. This situation is not favorable for the collection and utilization of data. Clearly we must overcome these geographic difficulties, and it appears that research work on systems similar to the American tracking and data relay satellites are very essential. In the meantime, we should look into preliminary data processing and data storage on the satellite. Once the satellite had acquired data while over foreign countries, excessive unwanted signals could be deleted and essential data extracted and stored until the satellite entered the visibility range of Chinese ground

stations, where the [data] would be transmitted down in a relatively narrow frequency bandwidth. If neither of the above two solutions is achieved, the development of China's utility satellites (at least the low-altitude ones) will suffer considerable limitations. A solution to this problem rests mainly with the efforts of people working in the space electronics field.

Considerable difficulties have been encountered in the course of developing China's space electronics: for instance, an inadequate variety of electronic parts and components, the quality of certain components not up to the standard of space application requirements, low-quality manufacturing techniques and a long lead time, and so on. But on the whole, China's endeavors in space electronics have had considerable strength and sophistication and, with sound organization, it is quite possible that before long China will catch up with advanced world standards in many areas of this field.

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CSO: 4008

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The Research on Cu-Ti Diffusion Layer in Composite Superconductor NbTi50/Cu.....Guo Jiyan [6753 4949 1693], Xiong Shougao [3574 1108 7559] and Ma Wenming [7802 2429 2494], all of Baoji Institute of Non-ferrous Metals Research (240)

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[Text] A Study on the Stator Vibration and Its Suppression in 300 MW Turbo-generator.....Yu Maohong [0205 5399 1347], Le Meifeng [2867 5019 1496] and Wu Guanghao [2976 1684 5714], et al, all of the Department of Engineering Mechanics (1)

The Finite Element Analysis of the Three-Dimensional Electric Field Distribution in Composite Dielectrics.....Li Kaitai [2621 7030 3141], Huang Aixiang [7806 5337 7449] and Huang Qinghuai [7806 1987 2037], all of the Department of Mathematics (15)

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AUTHOR: XU Yuqi [1776 3768 7784]

ORG: None

TITLE: "Analysis of Telephone Pre-loaded Network in Satellite Communication"

SOURCE: Shanghai DIANZI JISHU [ELECTRONIC TECHNOLOGY] in Chinese No 2, Feb 80 pp 6-8

ABSTRACT: In satellite communication, telephone pre-loaded network is one method of improving the signal noise ratio and raising the quality of the circuit. Based upon the property requirements of international satellite organization, the author and colleagues designed and tested a pre-loaded system which raises the high frequency component of the signals before transmission to compress the low frequency component of multi-frequency signals. In this manner, the high frequency segment and signal noise ratio is improved. When the signals reach the destination, signal noise ratio of the various paths tends to be the same. In order to recover the original wave form, generally a network with the opposite characteristic is installed at the output terminal of the demodulator of the reception system to remove the added load. The technical indices, the network analysis, the computation equations, the circuit diagrams, and the experimental data are given.

AUTHOR: None

ORG: Automatic Telegram Transmission Research Group, Shanghai Bureau of Telegraphy

TITLE: "Application of DJS-131 Electronic Computer in Automatic Transmission of Telegrams"

SOURCE: Shanghai DIANZI JISHU [ELECTRONIC TECHNOLOGY] in Chinese No 2, Feb 80 pp 10-12

ABSTRACT: Shanghai Bureau of Telegraphy is responsible for a busy domestic and international telegraphic traffic. For the purpose of changing the backward condition of manual transfer of telegrams, the bureau began to study the new technique of using electronic computer for automatic transfer of telegrams, with the assistance of Shanghai Radio Thirteenth Plant and Fudan University in 1975. Two DJS-131 electronic computers were installed in 1976 and 77 respectively. Intermediate tests have proved that the system is basically functioning with a period of stability of several hundreds of hours. The average time for transferring a telegram is about 3 minutes, 1/10 of the time required for manual transfer. The error rate is 0.04 percent, amounting to 1/8 of the rate of manual work. Currently the intermediate tests are being reviewed so that the system may soon be operating officially. The work principle of the automated system, and the hard and soft characteristics of the system are discussed.

AUTHOR: ZHU Yaofang [2612 5069 2455]

ORG: State Operated 822 Plant

TITLE: "Ultra-low Speed Miniature Digital Magnetic Tape Machine"

SOURCE: Shanghai DIANZI JISHU [ELECTRONIC TECHNOLOGY] in Chinese No 2, Feb 80 pp 24-26, 23

ABSTRACT: Digital magnetic recording technology is now extensively applied in China. Under normal conditions, the magnetic recorder serves as an external storage equipment of digital electronic computers or for telemetric recording in space travel. A large quantity of data in such scientific research fields of aerial ore prospecting, oil well surveying, earthquake forecasting, and oceanographic studies must also be processed in modernized computers, however. These data cannot be obtained within a short period of time, and the recording equipment must have a large capacity, long recording time, small volume, light weight, and minimal power consumption. The author and colleagues studied and made for the State's Bureau of Oceanography the SC-2 and the SC-2P magnetic tape machines capable of both writing and reading. The principle of writing, the magnetic writing head and circuit, and the magnetic reading head and circuit are described.

AUTHOR: CHENG Daming [4453 6671 6900]

ORG: None

TITLE: "New Method of Making Electron Gun Electrode--Electric Casting Method"

SOURCE: Shanghai DIANZI JISHU [ELECTRONIC TECHNOLOGY] in Chinese No 2, Feb 80 pp 27-29

ABSTRACT: The so-called electric casting method is to use a suitable metal to make a core mold first before using electroplating method to add a layer of metal in a suitable thickness. Finally, a method must be found to release this layer of electroplated metal from the core mold. Unlike electroplating which is for the purpose of protecting the metal under the plating from oxidization and corrosion, the purpose of electric casting is to make the item in accordance with the size and shape of the core mold. The casting layer; therefore, must be thicker than the plating layer. The key to this method is how to remove the core mold. After repeated experimentation, the author and colleagues adopted the rapid heating and rapid cooling technique. Utilizing the different expansion coefficients of the 2 metals, the metal core can be separated from the plated metal of the surface to form the needed electron gun. Related problems are discussed.

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(2) CHEN Fangchun [7115 5364 2504]
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(4) WU Fubao [0702 4395 1405]
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TITLE: "New Products Introduced"

SOURCE: Shanghai DIANZI JISHU [ELECTRONIC TECHNOLOGY] in Chinese No 2, Feb 80 pp 8; 41,18; 42-43; 43; 44

ABSTRACT: Five new products are introduced: (1) The SYD-201 Computer: A small general purpose computer with an entirely new system design, suitable for scientific calculation, data processing, and real-time control, etc. is now being produced in small batches. (2) Three Base Line Transistor Receiver High Frequency Frequency Scanning Device: The technical properties and the block diagram of the entire receiver are given. (3) XB19 Standard Signal Generator: It is soon to be officially manufactured by the Shanghai Radio 26th Plant. It is all transistorized, weighing 24 kg. It may be used to test 10 cm wave band microwave system signal source. Major properties and work theory are described. (4) PJX-1 Circuit Board for Semiconductors: It has 375 soldering points and 30 leading out

[continuation of DIANZI JISHU No 3 1980 pp 8; 41,18; 42-43; 43; 44]

terminals. The technical data are given. (5) D030 Triple Purpose Meter Testing Instrument: It is designed for testing ordinary triple-purpose meter and various electromagnetic probing head below the 1.5 grade. The instrument, a type of AC DC voltage current generator, is made by Weifang City Institute of Electronics Research.

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CSO: 4009

AUTHOR: LU Kai [7120 1956]
WU Jianzhong [0702 0256 0022]

ORG: Both of the Precision Instruments Department

TITLE: "Discussion on the Designing Parameters of an Electro-Controlled Gyro-Compass"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 1-19

TEXT OF ENGLISH ABSTRACT: The following questions about an electro-controlled gyro-compass are discussed in this paper. They are the characteristics of the ballistic error, the accumulation of ballistic errors, the error due to the unchanged control torque of the speed corrector when the ship's speed is changing in the maneuvering process and the relationship between the parameters of the compass and the error due to the random disturbances. On this basis the authors have put forward their ideas about how to choose the parameters of an electro-controlled gyro-compass.

AUTHOR: LIU Yanzhu [0491 1693 2691]

ORG: Engineering Mechanics Department

TITLE: "On the Dynamics of an Imperfect Dynamically Tuned Gyroscope"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 21-33

TEXT OF ENGLISH ABSTRACT: Some problems of the dynamics of a dynamically tuned gyroscope under imperfect conditions is discussed in this paper. The influence of some imperfect factors, such as the nonorthogonality and nonintersection of the system of gimbal axis, the mass unbalance of the rotor and gimbal, on the dynamics of the gyroscope is investigated. The disturbing torques associated with the linear and angular vibration of the gyro's foundation are derived. It also gives the theoretical analysis and evaluation of some designs of single-gimbal or double-gimbal tuned gyroscopes with nonintersecting gimbal axis.

AUTHOR: JIN Zhongji [6855 0112 7535]

ORG: Precision Instruments Department

TITLE: "RC Transfer Function Synthesis--A Cascade Synthesis Method with Two-Pole Admittance Functions"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 35-48

TEXT OF ENGLISH ABSTRACT: A method is developed for synthesizing RC high order transfer functions by cascade processes. Complex zeroes can be realized in a RC network by the cascade synthesis method since Dasher and Guillemin developed a more elegant method. Their methods have been widely used in engineering practice, especially in control system design. This paper gives an extension of Guillemin's method; here two-pole admittance functions are used to realize three zeroes at once (per cycle), and thus the complex zeroes in the right half plane can also be realized. A realization theorem for two-pole admittance functions is derived in which the realizable region of the numerator coefficients of the transfer admittance is determined. It is useful when a RC series-parallel network is synthesized. Using this method, relatively simple circuit structure and reasonable circuit parameters can usually be obtained in the resulting network.

AUTHOR: YUAN Tianxin [5913 1131 9515]
HE Huanxi [0149 3562 3588]

ORG: YUAN of the Electrical Engineering and Computer Science Department; HE of the Applied Mathematics Department

TITLE: "Optimal Design of Marine (Long-Time Operating) Semi-Analytic Inertial Navigation System"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 49-63

TEXT OF ENGLISH ABSTRACT: In this paper a simplified method of optimal design applied to semi-analytic inertial navigation systems of marine (long-time operating) is discussed. When the simulation is carried out on the digital computer DJS-6, in order to evaluate the performance of the simplified optimal design approach, the square root algorithm is used for optimal recursive filter (Kalman filter) so as to reduce the effect of computational error on the filter, and a set of non-linear equations in the case of linear motion with constant velocity is employed for the equations of the inertial navigation system. Thus, the above-mentioned method is close to the actual case. The detailed derivation of the principles of inertial navigation and optimal recursive filter have not been made, and some conclusions concerning modern control theory are used directly in this paper.

AUTHOR: ZHAO Jiaju [6392 1367 7467]

ORG: Applied Physics Department

TITLE: "Coherence Properties of a Pulsed Frequency-Doubled Nd:YAG Laser"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 65-72

TEXT OF ENGLISH ABSTRACT: The coherence properties of a Q-switched frequency-doubled Nd:YAG laser have been investigated by a Michelson interferometer and photography. In this experimental study, coherence degree $|\gamma_{(\tau)}|$ was measured as a function of path length difference and of the ratio of input energy to threshold input energy. The coherence length measured was 40 mm at a ratio of input energy to threshold energy of 3.2. Spatial coherence of the beam was deduced from the fringes formed by a Michelson interferometer in which the laser beam interferes with itself after being rotated 180^{0}. The experimental results are physical interpreted.

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ORG: Electrical Engineering and Computer Science Department

TITLE: "A Synthesis Approach of Typical Automatic Control Systems by Using Only the Bode Gain Plot"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 73-82

TEXT OF ENGLISH ABSTRACT: According to the corresponding relationship between the Bode gain plot and the Bode phase plot of a minimum phase system, the performance of a system can be uniquely determined. The relationship between the Bode gain plot and the system's performance has been carried out with the aid of a digital computer, and a set of durves has been obtained. Thus, we present an approach for the synthesis and design of typical control systems by using only the Bode gain plot, and it is not necessary to use the Bode phase plot. This approach greatly simplifies the design procedures and reduces a large amount of effort in designing a control system.

AUTHOR: SHAO Shiming [6730 0013 2494]
WANG Yuncai [3769 0061 2088]
CHEN Liangquan [7115 5328 2938]

ORG: All of the Ship Hydrodynamics Department

TITLE: "The Effects of Bow Spray Strips on Resistance and Seakeeping Qualities of High-Speed Displacement Hull"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 83-91

TEXT OF ENGLISH ABSTRACT: Fitting bow spray strips on the hull of high speed displacement vessels is a simple and effective method of restricting the bow wave and spray. However, the reduction in resistance can be achieved only in the case of Froude Number $Frn > 1.0$.

In order to extend the speed range of reducing the resistance by fitting bow spray strips, an experimental investigation has been carried out in the Ship Hydrodynamics Laboratory of Shanghai Jiaotong University. The model test results show that not only are the bow wave and spray considerably improved by fitting a favorable combination of bow spray strips and stern flap, but the following achievements are also obtained:
(1) The speed range of reducing resistance is extended from $Fr_n > 1.0$ to $Fr_n > 0.5$;

[Continuation of SHANGHAI JIAOTONG DAXUE XUEBAO No 3, May 80 pp 83-91]

(2) An amount of 6.5 percent reduction in total resistance or 14 percent reduction in residuary resistance is obtained within the whole experimental range. It corresponds to 1.5 knots increase of design speed for the actual ship at the same effective horsepower.
(3) The seakeeping qualities are also improved.

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SHEN Weidao [3088 4850 6670]

ORG: Both of the Power Mechanics Engineering Department

TITLE: "Analytical Solutions of the Temperature Field of High Pressure Vessels During Annealing by Electrical Infrared Radiation Heaters"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 93-106

TEXT OF ENGLISH ABSTRACT: After welding of high pressure vessels, annealing is necessary to remove the residual stress which is induced during the welding. For large high pressure vessels, the most economical and effective method is to adopt electrical infrared radiation heaters both for heating and annealing along the welding seams. But, for the sake of the right uses of this method of annealing, the temperature field near the welding seam during the heating and annealing processes must be thoroughly studied.

The heating and annealing processes have been analyzed, and a physical-mathematical model for the research of the temperature field is proposed. Partial differential equations of 2-D of steady and transient states in complex boundary conditions are derived. After making two reasonable assumptions and by applying some skillful methods, we succeeded in transforming a 2-D partial differential equation into two

[Continuation of SHANGHAI JIAOTONG DAXUE XUEBAO No 3, May 80 pp 93-106]

1-D equations, and then derived the analytical solutions of the above-mentioned equations by means of mathematical analysis and Laplace-transformation. The solutions thus obtained almost coincide exactly with the results obtained from digital computations by the computers.

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ZOU Zhonggui [6760 1813 2710]
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TITLE: "JD (Jiaotong University)-1 Foundry Core Binder of Complexed-Crosslinked Type"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 107-120

TEXT OF ENGLISH ABSTRACT: The JD-1 foundry core binder is developed on the basis of polyacrylic acid with a series of modifications, such as terepolymerization, crosslinking, neutralization to ammonium salt and formation of polyionic complex with polyarylamide.

The JD-1 foundry core binder has many advantages, viz:
(1) It is incombustible, inexplosive and not corrosive.
(2) It is poisonless and odorless during core-making, drying and casting. It causes no environmental pollution.
(3) The cores made from the JD-1 foundry binder have high dry strength, low gas evolution, good deformability, excellent collapsibility (knock-out property), satisfactory dimensional accuracy and surface quality.

[Continuation of SHANGHAI JIAOTONG DAXUE XUEBAO No 3, May 80 pp 107-120]

The JD-1 foundry core binder can successfully take the place of the oil binder (tung or linseed oil). Core sands prepared from the JD-1 foundry binder are suitable for producing non-ferrous castings with hollows or water jackets of intricate shapes.

The mechanism of hardening and basic properties of the JD-1 foundry core binder have also been investigated.

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TITLE: "Superplasticity of Ball Bearing Steel"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 121-133

TEXT OF ENGLISH ABSTRACT: The paper presents the results of a comprehensive study on achieving superplasticity with commercial ball bearing steel. A series of tests have been made for the influence of heat treatment technology on grain size and the influence of deformation temperature, strain rates and grain size on the elongations during the superplastic tensile test.

Results of these tests showed that specimens twice quenched in oil possess the greatest practical value and their elongations are more than 500 percent. The deformation temperature and strain rates of superplastic alloys alternately influence each other within the fixed range. Thus, ball bearing steel possesses superplasticity with larger elongations within 680-730°C temperature and $1.2 \times 10^{-2} \sim 2 \times 10^{-3}$ min^{-1} strain rates in which its least elongation is more than 400 percent. All these parameters will create favorable conditions for superplastic forming of ball bearing steel.

[Continuation of SHANGHAI JIAOTONG DAXUE XUEBAO No 3, May 80 pp 121-133]

Ball bearing steel possesses the largest value of strain rate sensitivity index $m = 0.4$ at the temperature 680°C, $\dot{\varepsilon} = 1.2 \times 10^{-2}$ min^{-1} strain rate.

AUTHOR: JIN Yongjie [6855 3057 2638]
LI Kangxian [2621 1660 0341]

ORG: Both of the Engineering Mechanics Department

TITLE: "Limit Load of Opposed Extrusion-Piercing in Plane Strain"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 135-146

TEXT OF ENGLISH ABSTRACT: This paper is prepared for solving the problem of opposed extrusion-piercing in the condition of plane strain. The material is assumed to be a rigid-perfect plastic material. The working conditions of extrusion and piercing assume that the punch surface and the wall of the container are smooth and frictionless. The authors analyzed and calculated this problem under the condition that the reduced rates of the above and below holes are both two-thirds. This calculating method also can be applied in the other condition in which the reduced rate of the above hole is equal to that of the below one. On calculating the lower bound, we utilize the discontinuous line of stress. We have found many statically admissible stress fields, and have deduced a calculating formula with the geometric relation of Prager's stress plane. Furthermore, we utilize the discontinuous line of velocity on calculating the upper bound. These methods are simple and easy. The values of upper and lower bound which the authors obtained are compared to each other.

AUTHOR: JIANG Sijie [5592 1835 2638]

ORG: Power Mechanics Department

TITLE: "The Synopsis of a Computer Program for the Analysis of Composite Structure"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 147-155

TEXT OF ENGLISH ABSTRACT: The computer program RCS described in this article is a general program for the solution of spatial thin-shell-and-bar composite structure, using the method of multiple substructures. The present article describes the principle of substructures and several new techniques used in the program.

AUTHOR: YAN Zhiyuan [0917 2535 3220]

ORG: Industrial Engineering Department

TITLE: "Queuing Theory and Its Application"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 3, May 80 pp 157-167

TEXT OF ENGLISH ABSTRACT: This article is intended to provide the basic concept and method of queuing theory for the reader. The author hopes that engineers, managers and others responsible for engineering design, industrial production and management may find that the queuing theory is a useful guide to the problems and methods treated, with a view to practical applications. This article explains what the queuing theory is and interprets its commonly-used terms in popular language. The queuing theory can be applied to various fields, such as industry, agriculture, transportation, national defense and urban service systems, etc.

This article contains several case studies and makes some heuristic discussions on its results.

9717
CSO: 4009

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WANG Bin [3769 2430]
ZHANG Dada [1728 1129 6671]
et al

ORG: All of the Institute of Genetics, Chinese Academy of Sciences, Beijing

TITLE: "Studies on DNA-Dependent RNA Polymerases. III. Comparative Study between Two RNA Polymerase B from Liver Cells of Normal 615 Mouse and Leukemic 615 Mouse"

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 3, Sep 80 pp 201-207

TEXT OF ENGLISH ABSTRACT: We have studied RNA polymerase B of normal cells and leukemic cells from 615 mouse. It is found that two forms of RNA polymerase B exist in liver cells, one of them is of the engaged form while the other is of free form. In comparison of RNA polymerase B in the leukemic mouse (L615) with that of the normal mouse (615), we have found there are two protein bands associated closely with L615 enzyme B, but not with 615 enzyme B. For these two forms of enzymes the optimum ionic strength of ammonium is about 90 mM; of the stimulating activities for the two enzymes, manganese ion is stronger than magnesium ion. The two kinds of RNA polymerase B are very sensitive to the inhibition of α-amanitine, but the L615 mouse RNA polymerase B is more sensitive. The denatured DNA is a suitable template for transcription of the two RNA polymerase B's.

AUTHOR: WU Lifu [0702 4539 3940]

ORG: Department of Biology, Guiyang Medical College, Guizhou

TITLE: "A Case Report of 9p+ and XXq- Syndrome"

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 3, Sep 80 pp 268-270

TEXT OF ENGLISH ABSTRACT: Chromosome abnormalities were studied in a girl with multiple congenital anomalies. Trisomy of the short arm of chromosome 9 (9p+) and distal deletion of the long arm of X-chromosome were found with G banding and C banding techniques. The clinical features included psychomotor and growth retardation, short stature, moderate microcephaly, hypertelorism and enophthamos, prominent nose with inverted nostrils, short upper lip, low-set ears, low posterior hairline, anomalies of phalanges and vertebrae, widely-spaced hypoplastic nipples, undeveloped breasts, delayed onset of menarche and dermatoglyphic abnormalities.

AUTHOR: WANG Yuewu [3769 1547 0063]
JIA Xinkang [6328 2450 1660]
WU Zhengkai [0702 2973 1956]

ORG: WANG of Nankai University, Tianjin; JIA and WU both of Hebei Pharmaceutical Works, Tianjin

TITLE: "The Plasmid Transformation in Kanamycin-Producing Strain Kp 958-4 in Relation to Producing Antibiotics"

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 3, Sep 80 pp 276-280

TEXT OF ENGLISH ABSTRACT: The transformation principle Ko-p 77 which possessed the ability of producing kanamycin and forming spores was obtained when the plasmid-negative strain Ko 42-7 used as recipient was transformed with the kanamycin-producing strain Kp 958-4 as donor. The antibiotic spectra of Ko-p 77 and Kp 958-4 were similar to the Rf-values in the six solvent systems used. These denoted that the plasmid DNAs derived from the strains of S. kanamyceticus could carry out the transformation between the strains themselves.

AUTHOR: LIU Ruiqing [0491 3843 3237]
GUO Jianmin [6753 0256 3046]
ZHANG Yaoping [1728 5069 1627]
DING Linhua [0002 3829 5478]

ORG: All of Kunming Institute of Zoology, Chinese Academy of Sciences, Kunming

TITLE: "Studies on the Chromosomes of Tumors in Common Laboratory Animals. II. Karyotypic Analysis of the Walker 256 Carcinoma of the Rat"

SOURCE: Beijing YICHUAN XUEBAO [ACTA GENETICA SINICA] in Chinese No 3, Sep 80 pp 281-286

TEXT OF ENGLISH ABSTRACT: In the present paper the karyotype of the Walker 256 carcinoma of the rat is analyzed with several banding techniques. The results show that the Walker 256 carcinoma is hypo-triploid with a modal number of 57-58 (18.0-23.5 percent) and eight marker chromosomes. By Ag-AS procedure, silver stained NORs (Ag-NORs) are visualized as black spherical bodies on three chromosomes in the karyotype of the Walker 256 carcinoma.

9717
CSO: 4009

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ORG: Sichuan Asbestos Mine

TITLE: "Making of Pits by Deep Hone Continuous Blasting"

SOURCE: Beijing FEIJINSHU KUANG [NONMETALLIC ORES] in Chinese No 1, Feb 80 pp 1-7

ABSTRACT: The section-by-section deep hole continuous blasting method is an easy, safe and effective way of blasting a pit. The method uses a working hole, an empty hole and surrounding holes, each of which except the empty hole contains explosive in several sections separated by filler, with each section separately detonated. The empty hole parallel to the working hole provides room for the initial blast to force away the rock in between; the blasts in the surrounding holes can then move the rock into the space left by the working hole and empty hole. The quantity of explosive in each hole must be carefully chosen so as to avoid jamming subsequent holes and preventing explosion. Methods of choosing blast hole size and spacing in terms of the rock category are discussed and the principle of a spiral arrangement of successive holes is described. The principles for determining the quantity of explosive used, thickness of packing between sections so as to prevent jamming, and size of sections are described.

AUTHOR: ZHANG Jinfa [1728 2516 4099]

ORG: Yingcheng Gypsum Mine, Hubei

TITLE: "Five-Man Three-Cycle Rapid Tunneling"

SOURCE: Beijing FEIJINSHU KUANG [NONMETALLIC ORES] in Chinese No 1, Feb 80 pp 29-31

ABSTRACT: In order to organize rapid tunneling, a coordinated system was worked out in which each of five groups has a specific set of activities of carefully planned duration which dovetail with those of the other four groups in a 3-hour cycle. Thus two of five groups are engaged in drilling while three groups are engaged in putting up supports and subsequently in laying track and packaging explosive. While two groups are inserting the explosive and detonating it, three groups are cleaning the tools; while two groups are doing ventilation work, three groups are engaged in preparing the workface; and finally, all five groups are busy with rock loading. Calculations by which the drilling parameters are determined are illustrated. The average advance per cycle is 1.3 meters, the average blasting efficiency 95 percent, the average advance per shift 3.9 meters, the average explosive used is 10.3 kg/meter, and the average monthly advance 363 meters (3 shifts a day).

AUTHOR: SONG Yubao [1345 3768 0202]

ORG: Jinzhou Asbestos Mine

TITLE: "Improvement of a Hydraulic Rock Drill Forging Machine"

SOURCE: Beijing FEIJINSHU KUANG [NONMETALLIC ORES] in Chinese No 1, Feb 80 p 39

ABSTRACT: Improvements made on a hydraulic rock drill forging machine were as follows. A different electric motor more suited to the specific pace of production was fitted, saving 52 kwh a day. Previously, hot cutting of the tool tip had been done on a pneumatic machine, but this operation was transferred to the hydraulic device, and a special cutting tool designed for the purpose. Steel hydraulic pipe was replaced by rubber-coated woven wire hydraulic hose, a hole punch shape was improved and a support frame added. The one remaining use of the pneumatic forging machine, that of making bolts for a rock crusher, was also transferred to the hydraulic forging machine.

AUTHOR: None

ORG: Technical Department, Jinzhou Asbestos Mine

TITLE: "Introduction to Two Simple Automatic Ore Release Gates"

SOURCE: Beijing FEIJINSHU KUANG [NONMETALLIC ORES] in Chinese No 1, Feb 80 p 44

ABSTRACT: The automatic gates for releasing materials from hoppers were developed. The first was a fan-type gate closing the tailings hopper at the concentration plant. This gate was worked by a cable attached to the ground; when a truck backed into it, it pulled open the hopper gate. The other device was for loading large pieces of spoil rock (300 mm) into trucks. It was a horizontal sliding gate under the hopper and it was operated by a board onto which the truck backed, pulling a cable which slid the gate open. When the truck drove off the board, a counterweight pulled the gate closed again.

AUTHOR: ZHOU Zhike [0719 1807 4430]

ORG: Xinzheng Asbestos Mine, Chaoyang, Liaoning Province

TITLE: "The NG500 Asbestos Fiber Concentrator"

SOURCE: Beijing FEIJINSHU KUANG [NONMETALLIC ORES] in Chinese No 2, May 80 p 1-2

ABSTRACT: The NG500 asbestos fiber concentrator, based on foreign equipment, uses a large rotating drum against which the fibers are drawn. The asbestos fiber recovery rate is 90 percent, compared with 60 percent for foreign machines. The sand content is 30 percent, compared with 60 percent for foreign machines. A diagram of the machine is presented.

AUTHOR: LI Jierong [2621 4105 2837]

ORG: Research Institute, Nanbi Graphite Mine

TITLE: "Improve Graphite Flotation Processes, Improve the Classification Recovery Rate"

SOURCE: Beijing FEIJINSHU KUANG [NONMETALLIC ORES] in Chinese No 2, May 80 pp 24-32

ABSTRACT: The development of processes used in the mine over a 30-year period is detailed: a process with two grinding steps and 6 concentration steps; a process with 5 grindings and 11 concentrations; a process of stepped-up concentration of the reground graphite; a process with thickening and regrinding of middlings; a process with successive middling recovery; and a simplified process with several of the steps combined. Flow charts of all the processes are included. A discussion of the principles on which selection of flowcharts for flake graphite should be based is given.

8480
CSO: 4009

AUTHOR: WANG Mingzhong [3769 2494 1813]

ORG: None

TITLE: "Tidbits of Canadian Satellite Communication System

SOURCE: Shanghai DIANKIN KUAIBAO [TELECOMMUNICATIONS BULLETIN] in Chinese Nos 1-2, 1980, pp 1-10

ABSTRACT: This article begins with a brief introduction to the history and development of microcomputers abroad and classifications of microcomputers according to the word length, power level and structure. It goes on to describe applications of microcomputers in the telephone exchange with specific examples including UNIMAT series small exchange, ITT Model 1220 digital exchange with Delta 16 microprocessor, etc.; applications to telephones with specific examples including Transaction digital telephone developed by the Bell Laboratory; and applications to real-time digital signal processing. Some of the problems encountered in the process of applying microcomputers to the communication system and the demands on microcomputers are also briefly discussed. Included are several tables and diagrams describing the characteristics of some microcomputers and illustrating the method of application of these microcomputers. A bibliography consisting of 11 papers is also included.

AUTHOR: WU Zhong [0702 1813]

ORG: None

TITLE: "Some Applications of Microcomputer in Communications Abroad"

SOURCE: Shanghai DIANKIN KUAIBAO [TELECOMMUNICATIONS BULLETIN] in Chinese No 3, 1980 pp 27-42

ABSTRACT: This is a summary of a report prepared by the author after his visit to and inspection of Canada's satellite communication system. It briefly describes the organization of Canada's domestic satellite communications and an outline of its main ground station located at Allan Park in the suburbs of Toronto. It also describes the general conditions of Canada's international satellite communications, satellite communications equipment, and research and construction of this equipment. The future trend of Canada's satellite communications together with the impressions of the author about Canada's satellite communication system which China may take as an example or warning in the development of her own satellite communication system are also included. The authors impressions: 1) Communications enterprise must have well-defined division of labor as well as unified technological coordination. 2) Technological development must have a complete and well-defined plan. 3) New technology must be utilized as much as possible, but one should never lose sight of the economical effect. 4) Many Canadian enterprises are small in scale yet highly experienced and highly efficient.

AUTHOR: QIU Yuanheng [6726 3293 0077]

ORG: None

TITLE: "Corrugated Conical Feed

SOURCE: Shanghai DIANXIN KUAIBAO [TELECOMMUNICATIONS BULLETIN] in Chinese No 4, 1980 pp 1-12

ABSTRACT: Chromatic dispersion characteristics of space harmonic wave of the Floquet propagation mode of a periodically applied waveguide was analyzed theoretically. Applying Floquet principle, the fields in the two regions of a corrugated waveguide were found by the mode matching method using the continuity condition at r=a and other boundary conditions. Characteristic equations describing the relationship between propagation characteristics and tooth thickness and groove pitch were obtained. It was found that the HE_{11} propagation mode in a corrugated circular waveguide possessed a useful bandwidth of 2:1. Under an equilibrium mixed state, the HE_{11} mode was found to be axi-symmetric, circularly polarized with maximum in the axial direction and zero at a wall of the waveguide. Broadbanding by means of ring-loading of a corrugated waveguide was analyzed using groove admittance in the frequency range in which the groove admittance was capacitive admittance. The useful frequency bandwidth could be broadened to 3:1. The transverse field characteristics of a corrugated conical horn having $E_\phi=H_\phi=0$ on the boundary were also analyzed. The transverse component of field was found to vanish at the boundary where $\theta=\theta_0$. Finally, Huygen's principle was used to derive the plane field at the opening of the horn. It was found to be the far field radiation of a spherical

[continuation of DIANKIN KUAIBAO No 4, 1980 pp 1-12]

wave which was independent of the azimuthal angle ϕ. The directional diagram drawn on all planes passing through the axis were identical in shape, or the field was axi-symmetric. The field was also characterized by small side lobes and small intersecting polarization.

9113
CSO: 4009

AUTHOR: CHEN Jiansheng [7115 1696 3932]

ORG: None

TITLE: "Eliminating One Case of Malfunction in DT204 Remote Supply Frame"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 1, 80 pp 4-5

ABSTRACT: Inside the coaxial cable, there are 4 high frequency core groups capable of opening 12 lines of carrier waves. In the manned segment, an unmanned audio amplifer is needed every 12 km. The power of these unmanned audio amplifiers is supplied by the DT 204 type 1800-line carrier wave distant supply frame in which there is a 12-line supply disk, with 2 transmission disks in each supply line; when one is in operation the other is in a state of "cold readiness." Once upon a time, when the spare disk was in use, the main disk was unable to enter the state of "cold readiness." Each of the 2 disks was in good working condition independently, however. Following analysis, it was discovered that the base-collector of the BG_1 tube of the main disk was blown to result in a short circuit. When the tube was replaced, the trouble was eliminated. The process of analysis and the reason for the described trouble to occur when the BG_1 tube of the main disk is blown are described.

AUTHOR: LI Xinchang [2621 2450 7022]

ORG: None

TITLE: "One Case of Looking for 'Two-Line Terminal' Noise"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 1, 80 p 5

ABSTRACT: When a certain 12 Z-D-10 machine of the station with which the author was affiliated was being repaired, the "2-line terminal" noise of that machine was discovered to be high. The noise of the poorer line averaged -5.4 Np, and 50 Hz low frequency sound may be heard. For the purpose of locating the source of this problem, the machine's power supply, the 220 v rectifier was tested and its noise level was found to be normal and when a battery was used to supply the machine, the "2-line terminal" noise was not obviously improved. When other machines were shut off one by one at the station, the trouble remained the same. After these and other methods were used to pin point the source of the trouble, it was finally discovered that the C_{12} capacitor was broken. The noise was eliminated when C_{12} was replaced. The reason for the occurrence of such a noise level when the C_{12} of the 50 Hz oscillator disk is rendered ineffective is explained.

AUTHOR: ZHUO Liangjin [0587 5328 6651]

ORG: None

TITLE: "A Minor Improvement for the Chasis Circuit of a Double-headed Telegraph Transmitter"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 1, 80 pp 7-8

ABSTRACT: Various types of problems can occur if the 64-4 B double-headed telegraph transmitter is not operated properly or if it is not properly adjusted. If these troubles occur when the line is not busy, the current may become too great and coils may be burned. The author and colleagues made a small improvement to the circuit of the chasis to allow the components to be shut off automatically when the head is not in operation in order to maintain the 110 v power source of the circuit automatically. A circuit diagram is given to help explain the cause of the troubles and the reason for the minor improvement to be effective.

AUTHOR: SONG Yude [1345 2456 1779]

ORG: None

TITLE: "Long Distance Automatic Telephone"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in China No 1, 80 pp 22-25

ABSTRACT: At present, the manual method is mainly used for connecting long distance telephone in China. That is to say when two exchange stations are manually connected or if the long distance telephone companies of 2 cities are both equipped with automatic exchange stations, then, those customers who are authorized to use long distance telephone may dial the destination directly without first dialing "113" to register the intent of making a long distance call. For example, between Beijing and Hangzhou, the authorized customer just dial "0" to indicate it is long distance, then "611", the exchange number for Hangzhou, then 21601, if the destination is West Lake Hotel. When the line is not loaded, the connection requires only 10 seconds or so from Beijing. This paper describes briefly how this type of long distance telephone calls can be automatically connected. In one section of the paper, automatic switching of long distance phone calls and manual switching are compared.

AUTHOR: XU Kangsheng [1776 1660 3932]

ORG: None

TITLE: "Model Change Improvements of ZM202 Machine"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 2,80 pp 10-11

ABSTRACT: Since the ZM 202 type 3-line carrier wave telephone terminal was first put in production, it has been changed several times. The characteristics of the changes made in various models are explained in the paper for the convenience of maintenance persons. In the original model I, the regulating amplifier is changed manually to compensate for the line attenuation changes; the horizontal and diagonal control components are both capacitance voltage divider with no trigger. When model II was introduced, a thermoelectric automatic horizontal adjusting device was adopted to replace the manual one, and a 2.7 kHz low pass filter and a bell current generating device were added. In model III, a starter was added to the bell current generator to save power and to prevent the bell from ringing by mistake. An earthquake resistant cushion was added to the electron tube of the amplifier to reduce "seismic noise." Minor changes, such as using a diode amplitude modulator in the place of the copper oxide one, etc. are not specially mentioned.

AUTHOR: JI Hai [4764 3189]

ORG: None

TITLE: "The Ocean Floor Cable System of the Greatest Capacity"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 2, 80 p 11

ABSTRACT: This paper gives a brief history of ocean floor cables, starting with the earliest telegraph cable in the English Channel laid in 1850. By 1973, 140 ocean cables were in operation in the world. Today, the one with the greatest capacity is the cable system of NG 45 megahertz manufactured by the British Standard Telephone Cable Company. It was completed in 1977 to serve Rome, Spain, and various outlining islands of the region.

AUTHOR: JIANG Shiqiang [5592 1102 1730]
HUA Chunguang [5363 4783 0342]

ORG: None

TITLE: "Intermediate Frequency Electronic Switch Made by the Authors Themselves"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 2, 80 pp 14-15

ABSTRACT: When a television monitoring machine is used to check the quality of television programs, the intermediate frequency modulation signals are generally sent to the demodulation disk by cable before being sent to the monitoring machine. In actual practice, one monitoring machine is used to inspect one direction (for example, in the direction of Beijing). If at a given moment, there is a need for inspecting the wave quality of a station further down in the direction of transmission, the cable must be removed from the main wave path and plugged into the spare. If interference occurs in the meantime, it will not be detected on the monitoring screen. Furthermore, when the cable is regularly pulled and plugged, troubles can easily occur. In order to resolve this operative problem, the authors made an intermediate frequency electronic switch, which controls and connects the monitoring machine to a different channel at any time. The work theory and the circuit of the switch is described.

AUTHOR: XU Manzhen [1776 2581 3791]

ORG: None

TITLE: "Trends of Development of Batteries"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 2, Feb 80 pp 40-41

ABSTRACT: With the great leap in science and technology after the 1950's, people want batteries to be light weight, small, supplying more power, and longer useful life to cause many new types of batteries to be created. This paper describes the following types: (1) Dry lead batteries; (2) Lead calcium batteries ; (3) colloidal electrolyte lead batteries; (4) Hydrogen elimination batteries; (5) Bell System Cylindrical batteries. The fourth and the fifth types are discussed more in detail in the paper.

AUTHOR: None

ORG: Shanghai Huxin Telecommunication Instrument Plant

TITLE: "Products Introduced: Telephone Communication Safety Wire Dividing Equipment"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 2, Feb 80 p 47

ABSTRACT: The major equipment of telephone communication is the switching machine of the telephone bureau. In order that the switching machines may operate normally, there must be some auxiliary instruments, such as the power supply equipment for the switching machines and the telephone sets of the users, the testing instruments for maintenance and repair, and the connecting wires for the switching machines and the user's sets, as well as the safety wire dividing equipment to protect the safety of the switching machines and the personal safety of the users. The Shanghai Huxin Telecommunication Instrument Plant specializes in producing the safety wire dividing equipment for telephone communication. It has the most complete line of such products in the entire country. The products may be ordered through related ordering conference and delivery is fast. Six types of products are described in two separate sections of circuit breaking equipment and safety wire dividing equipment.

AUTHOR: YANG Renfa [2799 0088 4099]

ORG: None

TITLE: "Improvement to the Bell Current Circuit of the HJ905 Switchboard"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 3, 80 p 4

ABSTRACT: The users complained and the plant's test indicated that the bell current tube 2Z730G of the audio current circuit of the automatic telephone small switchboard HJ905 can be broken easily. Following analysis, the author believe that the reason for the triode to be easily broken is mainly an insufficiency of the reverse blown voltage BV_{CEO}. The BV_{CEO} of 2Z730G $\simeq$ 60 V although the handbook says it should be 90 V. To eliminate the trouble, the author suggests that the 4 diodes D_1 - D_4 should be soldered in reverse; the 4 resistors R_5 - R_8 should be changed to cause the resistance to be 68 Ω; the connecting line on the original printed circuit board should be altered according to the manner depicted on a graph; the soldering line of terminal 12 and that of terminal 15 in the rear of the printed circuit board of the bell current should be intered changed in order to eliminate the problem.

AUTHOR: WANG Qunshan [3076 5028 1472]

ORG: None

TITLE: "Improvement to the Arrangement Sequence of Channels in Microwave Machine Room"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 3, 80 pp 8-9

ABSTRACT: At present, in the microwave machine room, the microwave machines are arranged I, III, V channels and II, IV, VI channels. For the purpose of resolving the problem of relatively high series noise in some circuit segment passeses, some in-plant testing work of the 960 line I type machine high frequency frame was performed by Telecommunications 506 Plant. The test revealed that under the wave channel arrangement described above, due to filter reflection action, relatively large time delay is introduced into some wave passes to affect the series noise index of these passes. Based upon this finding, suggestions were made to improve the arrangement sequence. For the purpose of clarifying the original problem, the information receiving branch is used as an example to explain the time delay condition of the various wave passes. The condition of interference after the wave pass arrangement sequence is changed is also analyzed.

AUTHOR: WANG Guolan [3769 0948 5663]

ORG: None

TITLE: "Open 12-line Carrier Wave Telephone on a Microwave Repeater"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 3, 80 p 11

ABSTRACT: In order to meet the communication needs of tourism, our province [The author neglects to mention which province] experimented with opening 12-line carrier wave telephone on the 170-174 microwave repeater. The results of the experiment indicate that within a given communication distance, to open a 12-line carrier wave telephone using microwave repeater is possible. Problems of the repeater and problems of the junction between microwave and carrier wave equipment are resolved during the experiment. These problems and solutions are discussed.

AUTHOR: LI Guangya [2621 1639 0068]

ORG: None

TITLE: "Looking for A Trouble With the Waveguide Frequency Reception Control Disk"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 3, 80 p 13

ABSTRACT: Our bureau's [The author neglects to say what bureau] certain ZL3 waveguide frequency modulation system works normally when the modulator key is in "automatic" position and the receiving control key is in "manual heating" position, but if the control key is in either "survey" or "automatic" position, the indicator will suddenly sound an alarm and frequency will drop. When the "automatic regulator" potentiometer R_6 of the control disk is adjusted, the waveguide frequency indicator shows no effect. After a series of tests, it was discovered that the BG_{16} reverse resistance was only 4.5 kiloohm. When the BG_{16} was replaced, the waveguide frequency controlling device operated normally again. The process of testing and searching for the cause of the trouble is described.

AUTHOR: LI Xinchang [2621 2450 7022]

ORG: None

TITLE: "Unified Control of Carrier Wave Room Carrier Frequency"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 3, 80 p 14

ABSTRACT: In the carrier supply system of the currently available carrier wave machines, the main oscillator controlled resonance wave generator is mostly adopted to obtain the various needed carrier frequencies. When a problem occurs in the main oscillator, the carrier frequencies of both terminals will not be synchronous and the quality of communication will be affected or communication will be cut off altogether. For the purpose of improving the stability of carrier frequencies and simplifying carrier frequency synchronization, a 300 ZDL 300-line carrier wave machine main oscillator was used for all 3 carrier wave machines of a certain station to control the resonance wave generators of all 3 machines to 4 KHz sunchronous signals. The frequency stability is 3×10^{-7}/month. The procedure for adopting this improvement is described.

AUTHOR: SONG Yude [1345 2456 1779]

ORG: None

TITLE: "Municipal Local Telephone Coordinated Equipment for Long Distance Automatic Telephone"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 3, 80 pp 30-32

ABSTRACT: In Beijing, there are more than 20 telephone bureaus, and only a portion of these can open for long distance because the long distance bureau must install automatic switching equipment and the local bureau must also install long distance coordinated equipment in order to enable that local bureau to open long distance service. This paper explains the reason for the required long distance equipment in the local bureau. The procedure for an authorized user to make a long distance telephone call after his local bureau [station] has installed the appropriate equipment is described.

AUTHOR: CHEN Peizhen [7115 1173 3791]

ORG: Telecommunications 520 Plant

TITLE: "Brief Introduction of the Improved HJ905 Switchboard Machine"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 4, 80 pp 6-7

ABSTRACT: The HJ905 automatic telephone switchboard series are produced by the Telecommunications 520 Plant for internal communication of factories, government organizations, schools, etc. The series come in the 4 types of 200, 400, 600, and 800 switches and relays are provided to connect with municipal telephone bureaus and other small switchboards. The machines are of good quality and are easily maintained, but the 200-switch model has the shortcoming of not capable of being enlarged. If an organization has the need for expanding its switchboard it must order a larger model to replace it. This paper describes an improved design to allow the possibility of the new 200-switch model to double its capacity by adding new components instead of replacing it altogether.

AUTHOR: LI Xinchang [2621 2450 7022]

ORG: None

TITLE: "Small Improvement to the Safety Device"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 4, 80 p 13

ABSTRACT: If the fuse of the safety box of an open-wire carrier communication system is broken by lightning the communication system will be cut off. The author tried at a certain station to experiment with parallel connection of one capacitor each on both sides of the fuse. In that manner, when the thunder and lightening melt the fuse the carrier signals can still pass through the capacitors but the signals will be so obviously weakened to alert the maintenance persons. In the past 3 years since the improvement, the fuse at that station has been blown 8 times while the line has been kept operating throughout the period. An editor's note is attached inviting suggestions from readers concerning this experience.

AUTHOR: WU Xigen [0702 6932 2704]

ORG: None

TITLE: "One Case of Telegraphic Distortion Caused by the ZM202 Carrier Machine"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 4, 80 p 14

ABSTRACT: The end offices of both terminals of a telegraphic transmission line from our bureau [unspecified by the author] to a certain area complained about a serious condition of word distortion. At that time, the lines of the ZM202 carrier machine were undergoing major repairs; therefore, it was taken for granted that the distortion was caused by the repair work and nothing more was done. After the repair work was complete, the condition of distortion remained more serious than normal, but after the line was connected to a different carrier machine, the distortion phenomenon disappeared. Based upon these factors and the fact that unstable transmission current, noise in the circuit, and asynchronous carrier frequency may have caused the distortion, the machine was taken out of operation for testing. After exhaustive testing, it was discovered that for some of the ZM202 machines having no 2.7 kHz low frequency filter, opening a telegraphic transmission line would not be suitable.

AUTHOR: ZHU Fuxiang [2612 4395 4382]

ORG: None

TITLE: "Power Generator Charge Regulator"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 4,80 pp 17-19

ABSTRACT: China's oil fueled generators are mostly equipped with electrical starters. For the purpose of timely charging the starter battery and lightening the plant, etc. they are also equipped with charge generator and charge regulator, etc. Using the FT81-18/12AN/1 regulator as the example, this paper explains the work theory of a charge regulator and the method of installing it. The paper is an edited version of the original manuscript submitted by the author.

AUTHOR: WANG Yuqing [3769 5148 1987]
LI Xiaofeng [2621 2556 1496]

ORG: None

TITLE: "Four to One Method of Line Arrangement"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 4,80 pp 19-21

ABSTRACT: At present, the city telephone lines in China have 4 common methods of arrangement. One method is to connect lines directly to the cable; the second is doubling the connected lines; the third is alternately connecting lines; the fourth is using supplement and auxiliary lines. All four methods have merits and shortcomings. The authors suggest in the paper a four to one ratio to calculate bureau lines and auxiliary lines, based upon the current regulation of multiples of five for line division of telephone systems. The method and and its possible effects of increasing the cable utilization rate and guaranteeing the quality of transmission of the lines are explained.

AUTHOR: SONG Xiuhua [1345 4423 5478]
JIN Guirong [6855 2710 2837]
XI Penghua [1153 7720 5478]

ORG: None

TITLE: "Collection of Experiences in Overcoming Word Distortion in Telegraphic Transmission"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 5, 80 pp 1-4

ABSTRACT: At present, some units have complained about word distortion in telegraphic transmission using the double-headed telegraphic transmitter 64-4. For the purpose of resolving these problems, the General Bureau of Telecommunications of Ministry of Post and Telecommunications called a meeting in Changsha in Jan 80 to discuss the experience in operation and maintenance of the 64-4 double-headed telegraphic transmitter. In 3 separate items, this paper reports selectively the experiences reported at the meeting.

AUTHOR: LIAO Haiping [1675 3189 1627]

ORG: None

TITLE: "A Small Improvement to the Double-headed Telegraphic Transmitter"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 5, 80 p 4

ABSTRACT: In the 64-4 telegraphic transmission machine, the position of the word order magnetic disk is regulated by a stopping screw. Due to the fact that when the machine is in operation, the electromagnetic disk and the stopping screw strike one another constantly, they can easily be damaged by wear to affect the word transmission. The author and colleagues removed the stopping screw and installed a "L" shaped iron blade to regulate the position of the disk. Detail of the improvement is explained and depicted with drawings.

AUTHOR: WANG Xuewen [3769 1331 2429]

ORG: None

TITLE: "Improvement to the Transmission Relay"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 5, 80 p 5

ABSTRACT: In the operating process, adhesion at contact points regularly occurs to the singal relay, the transmission relay, and the C relay of the 64-4 double-headed telegraphic transmitter to cause word distortion to increase. In order to resolve this problem, the author and colleagues replaced the relays with the electronic relays produced by the Wire Electric Plant of Beijing Long Distance Telecommunications Bureau, but after a period of use, the transmission relay stopped working. Careful inspection disclosed the fact that the triode of the transmission relay became heated, and when the tube was allowed to cool off, the system was operative again, but the problem recurred again soon afterwards. After repeated examinations of the system, they used JR401 type relay with 2 groups of contact points (Product of Daning Relay Plant) to replace the original C relay so that one group of contact spring may be used to control the 110v power source of the transmission relay. After this improvement, the trouble has not recurred.

AUTHOR: DAI Fukui [2071 4395 1145]

ORG: None

TITLE: "Analysis and Repair of Cross-talk With the Receiver Off the Hook in the JZB-1 A Switchboard"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 5, 80 pp 8-9

ABSTRACT: When user No 3045 picked up the receiver, he heard the conversation of 2 parties through his receiver. After examination, it was discovered that when the dial was turned 6.5 steps, his line was connected with 2 other lines. In another case, when user No 2185 picked up the receiver and dialed, he was able to hear the conversation of 2 other parties. Examinations disclosed the fact that when his dial was turned 9 steps, contact with a group of selectors was made. Reasons for these troubles are analyzed and explained and repair measures discussed.

AUTHOR: YANG Bin [2799 2430]

ORG: None

TITLE: "Searching for Cause of One Incident of "Vibration" in a Unmanned Audio Amplifier for 1800 Lines"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 5, 80 pp 11-12

ABSTRACT: Station B and Station A are 2 adjacent manned stations of the 1800-line, and in between these 2 manned stations, there are a total of 19 unmanned stations, and of these,07 station and 15 station are single conduction frequency stations. Recently, an incident of "vibration" occurred between Station A and Station B. Abnormal frequency from B was received by A: the 4287KHz was high and the 308KHz and 8500KHz were extremely low. Alarms of all frequency monitoring points sounded off and very large noises occurred on the lines. The reason for the lines to produce self-excited vibration is analyzed and the process and the method of searching for the reason are reported.

AUTHOR: WANG Beingnan [3769 3521 0589]

ORG: None

TITLE: "Method of Adding The Characteristic of User Number Continuous Selection to HJ905"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 6,80 pp 3-6

ABSTRACT: At present, the HJ905 switchboard is adopted by the telephone stations of many industries. When individual industries have several telephone stations, it is possible for the some user switchboards to use the form of relays to enable the small user switchboard to have the user number continuous selection characteristic. Furthermore, when large industries require their fire-alarm telephone 119 or other special-use telephones to have more than two relay lines, the switchboard should also have the user number continuous selection characteristic. The original circuit of the HJ905 switchboad cannot satisfy this need. Many units did a large amount of work to add this characteristic to this switchboard and obtained a number of experiences of success. This paper reports one of the workable experiences.

AUTHOR: QIN Tingfa [4440 1694 4099]

ORG: None

TITLE: "Measures to Prevent the FY Relay Coil From Burned Out"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 6, 80 p 6

ABSTRACT: During the daily maintenance work process of the JZB-1 step-by-step switchboard, it was discovered that the 4-5 coil of the FY relay in the terminal connecting circuit (SV2.113.048) was frequently burned out. When that coil is burned out, the user would hear his telephone ring but when he picks up the receiver the other party cannot hear whatever he is saying. This paper explains the reason for the coil to be burned out constantly and the method to revise the circuit and eliminate such a problem.

AUTHOR: XIE Peixin [6200 1014 2450]

ORG: None

TITLE: "On the Problem of Word Distortion of the Double-headed Telegraphic Transmitter and the Method of Overcoming it"

SOURCE: Beijing DIANXIN JISHU [TELECOMMUNICATIONS TECHNOLOGY] in Chinese No 6, 80 pp 7-8

ABSTRACT: When the 64-4 double-headed telegraphic transmitter was used to send telegrams, the author and colleagues discovered the following 2 types of word distortion: (1) One of the words of F,A,U,K etc. is added to the end of a telegram after its transmission has been completed. (2) When the 2 heads, A and B are used for cross transmisstion, one additional word appears between the 2 telegrams. These 2 distortion phenomena can create mistakes and delays in international telegraphy or in automatic telegraphic transmission. This paper reports an analysis of these phenomena and the method of improving the circuit to eliminate them.

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